MI FluFocus

Influenza Surveillance and Avian Influenza Update

Bureau of Epidemiology
Bureau of Laboratories

Michigan Department of Community Health
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New updates in this issue:

- **Michigan:** Respiratory virus activity continues to be at no or very sporadic activity.
- **National:** Outpatient influenza-like illness was 0.8%, which is below the national baseline of 2.3%.
- **International:** Indian scientists find three new H1N1 variants; all remain susceptible to oseltamivir.

****2009 Influenza A (H1N1) virus Updates****

Please continue to reference the MDCH influenza website at www.michigan.gov/flu for additional 2009 H1N1 information. Local health departments can find guidance documents in the MI-HAN document library. In addition, additional laboratory-specific information is located at the Bureau of Laboratories H1N1 page at http://www.michigan.gov/mdch/0,1607,7-132-2945_5103-213906--,00.html.

****Influenza Surveillance Reports****

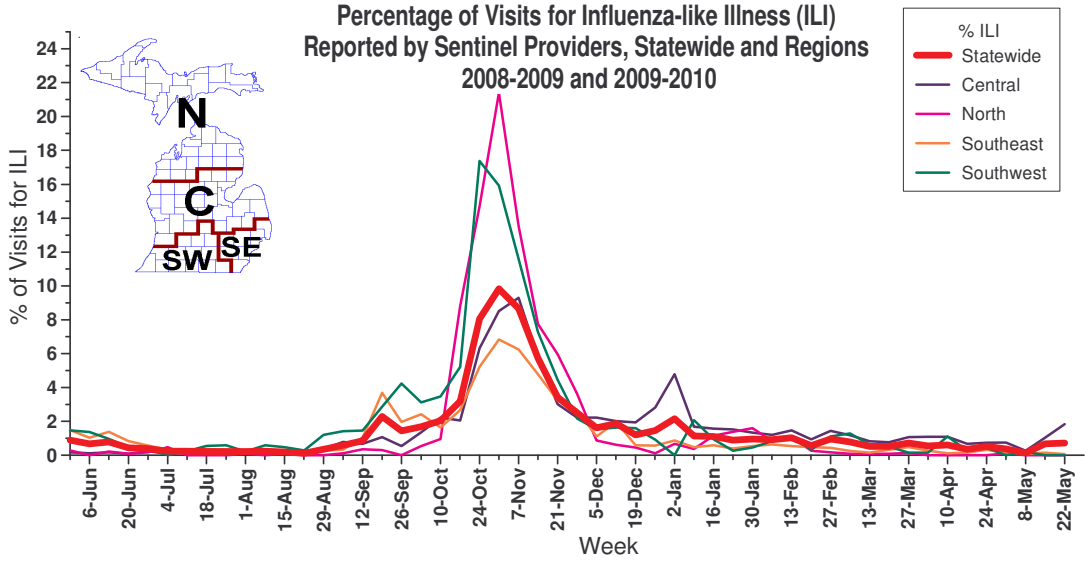
Michigan Disease Surveillance System: MDSS data for the week ending May 22nd showed that individual influenza and 2009 novel influenza reports remained near the previous week's levels of almost no activity. Reported cases of aggregate influenza slightly decreased during the same period. All reported influenza types were slightly lower than levels reported during the same time period last year. The higher levels of activity at this time last year are likely attributed to the first wave of the pandemic 2009 H1N1 influenza virus.

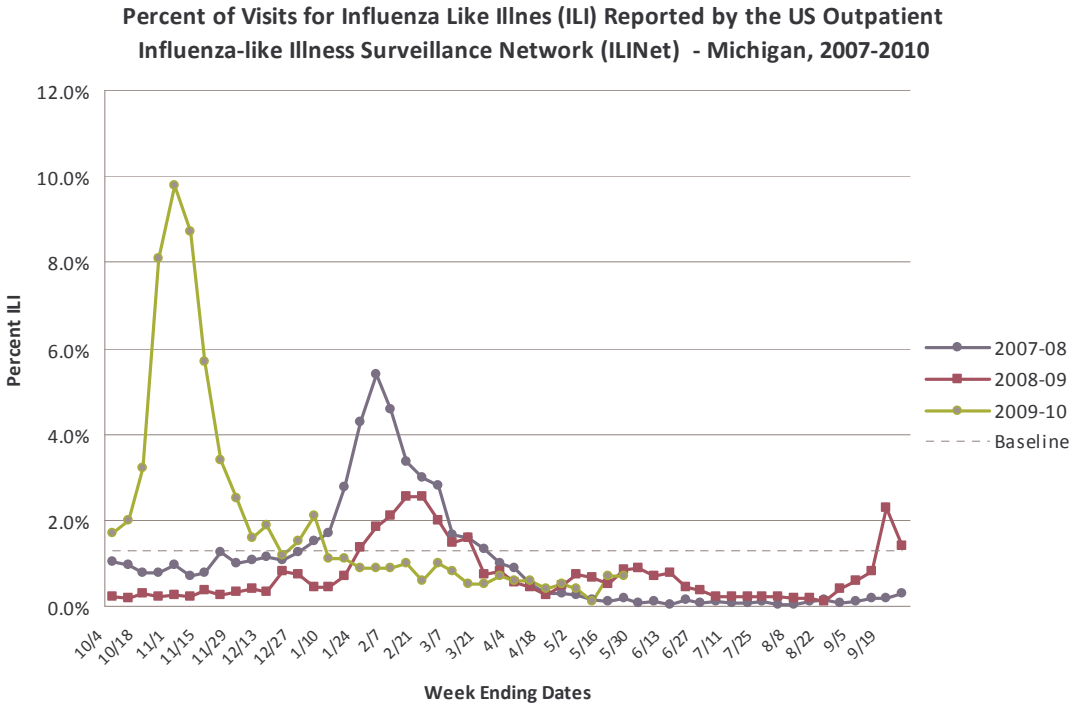
Emergency Department Surveillance: Emergency department visits from constitutional and respiratory complaints remained near the previous week's levels. Constitutional complaints were slightly lower compared to the same reporting period last year, while respiratory complaints were similar. During the past week, there was one state-wide constitutional alert, and ten in the C(5), N(2), SW(2), and SE(1) Influenza Surveillance Regions. There were also seven respiratory alerts in the C(3), N(2), and SW(2) Influenza Surveillance Regions. A few of the alerts during the past week may be attributable to an error in the syndromic surveillance system and are under further evaluation by MDCH staff.

Over-the-Counter Product Surveillance: Over the past week, OTC product sales of chest rubs, cough/cold aides, pediatric electrolytes and thermometers held steady with last week's levels. All indicators are consistent with levels seen during this time last year except for sales of chest rubs, which are slightly higher.

Sentinel Provider Surveillance (as of May 27): During the week ending May 22, 2010, the proportion of visits due to influenza-like illness (ILI) remained the same at 0.7% overall. Forty-four patient visits due to ILI were reported out of 6,203 office visits. Twenty sentinel sites provided data for this report. Activity increased in one surveillance region: Central (1.8%); and stayed the same in the remaining three surveillance regions: Southwest (0.0%), Southeast (0.1%) and North (0.0%). Please note that these rates may change as additional reports are received.

As part of pandemic influenza surveillance, CDC and MDCH highly encourage year-round participation from all sentinel providers. New practices are encouraged to join the sentinel surveillance program today! Contact Cristi Carlton at 517-335-9104 or CarltonC2@michigan.gov for more information.





Laboratory Surveillance (as of May 22): During May 16-22, MDCH Bureau of Laboratories identified no influenza isolates. For the 2009-2010 season (starting on October 4, 2009), MDCH BOL has identified 610 influenza isolates:

- 2009 Influenza A (H1N1): 609
- Influenza B: 1

Eight sentinel laboratories reported for the week ending May 22, 2010. All laboratories reported no influenza A or B positive test results (SE, SW, C, N). One lab reported sporadic RSV positives (C).

Michigan Influenza Antigenic Characterization (as of May 27): One 2009 H1N1 influenza A virus from Michigan has undergone further characterization at the CDC. This virus was characterized as A/California/07/2009 (H1N1)-like, which is the recommended strain for the H1 component of the 2010-11 Northern Hemisphere vaccine.

Michigan Influenza Antiviral Resistance Data (as of May 27): Results are currently not available for antiviral resistance at CDC for the 2009-2010 season.

Antiviral resistance testing takes months to complete and cannot be used to guide individual patient treatment. However, CDC has made recommendations regarding the use of antivirals for treatment and prophylaxis of influenza. The guidance is available at http://www.cdc.gov/H1N1flu/recommendations.htm.

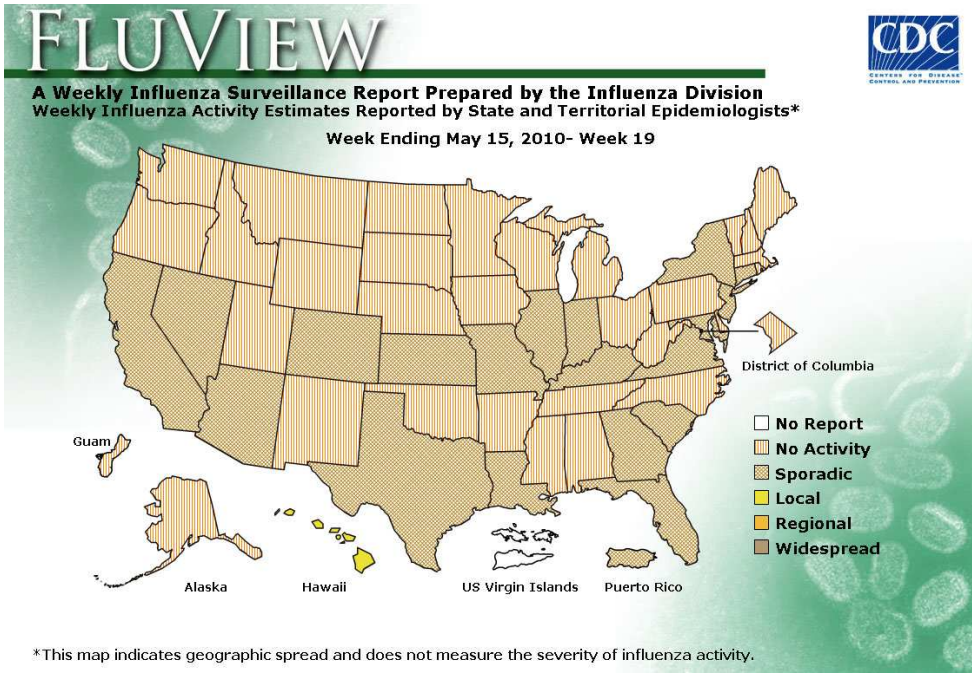
Influenza-Associated Pediatric Mortality (as of May 27): Five 2009 H1N1 influenza-associated pediatric mortalities (SE(3), SW, N) have been reported to MDCH for the 2009-2010 influenza season.

***CDC has asked states for information on any pediatric death associated with influenza. This includes not only any pediatric death (<18 years) resulting from a compatible illness with laboratory confirmation of influenza, but also any unexplained pediatric death with evidence of an infectious process. Please immediately call MDCH to ensure proper specimens are obtained. View the complete MDCH protocol online at http://www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf.

Influenza Congregate Settings Outbreaks (as of May 27): Seven congregate setting outbreaks with confirmatory novel influenza A H1N1 testing (2SE, 3 SW, 1C, 1N), and three outbreaks associated with positive influenza A tests (2C, 1N) have been reported to MDCH for the 2009-2010 influenza season. These are 8 school facilities and 2 long term care facilities. Human metapneumovirus was confirmed in one outbreak in a long term care facility (SW) in February.

During fall 2009, 567 influenza-related school and/or district closures in Michigan (Public Health Preparedness Region 1 - 55, Region 2N - 4, Region 2S – 8, Region 3 - 54, Region 5 - 153, Region 6 - 100, Region 7 - 109, Region 8 - 84) were reported.

National (CDC [edited], May 21): During week 19 (May 9 - 15, 2010), influenza activity decreased in the U.S. 14 (0.9%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza. All four subtyped influenza A viruses were 2009 influenza A (H1N1). The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold. No influenza-associated pediatric deaths were reported. The proportion of outpatient visits for influenza-like illness (ILI) was 0.8%, which is below the national baseline of 2.3%. All 10 regions reported ILI below region-specific baseline levels. No states reported widespread or regional influenza activity. One state reported local influenza activity. Puerto Rico and 19 states reported sporadic influenza activity. The District of Columbia, Guam, and 30 states reported no influenza activity, and the U.S. Virgin Islands did not report.



To access the entire CDC weekly surveillance report, visit http://www.cdc.gov/flu/weekly/fluactivity.htm

International (WHO Pandemic update 101 [edited], May 21): The current situation is largely unchanged since the last update. The most active areas of pandemic influenza virus transmission currently are in parts of the Caribbean and Southeast Asia. In the temperate zone of the northern and southern hemisphere, overall pandemic influenza activity remains low to sporadic. In central Africa, there has been increased transmission of seasonal influenza type B viruses, accounting for 85% of all influenza

isolates in the region. Influenza B also continues to be detected at low levels across parts of Asia and Europe, and has now been reported in Central America.

In the tropical region of the Americas, the most active areas of pandemic influenza virus transmission continue to be in parts of the Caribbean. In Cuba, a second period of active community transmission of pandemic influenza virus began during late February 2010, peaked during late April 2010, and has been declining since; this second period of transmission, although associated with severe and fatal cases, appears to be less intense overall than the first period of transmission which occurred during late September to late November 2009. In contrast, in the Dominican Republic, low to moderate intensity of respiratory diseases activity has been primarily associated with co-circulation of respiratory viruses other than influenza; only sporadic detections of seasonal influenza viruses have been reported. Low levels of pandemic influenza viruses have been circulating across parts of Central America and tropical areas of South America, for example, in Mexico since December 2009, in Colombia and Brazil since early 2010, and in Guatemala since early April 2010. Nicaragua and Honduras have also been recently reporting geographically regional spread of influenza viruses, however, the relative proportions of seasonal influenza, pandemic influenza, and other respiratory virus detections are not known. In contrast, in Panama, low levels of respiratory disease over the past three months have been primarily associated with circulating respiratory viruses other than influenza. Of note, Bolivia experienced a recent period of low but sustained transmission of seasonal influenza type B viruses between late February and early May 2010. There continues to be evidence from several countries in this region that there is ongoing co-circulation of influenza with other respiratory viruses (including respiratory syncytial virus (RSV), and adenovirus).

In Asia, the most active areas of pandemic influenza virus transmission are in parts of South and Southeast Asia, particularly in Bangladesh, Malaysia, and Singapore. In Malaysia, limited data suggests that a second period of active pandemic influenza virus transmission has been occurring since early April 2010, but overall activity may have recently stabilized and does not appear to exceed pandemic influenza activity seen during an earlier period of transmission lasting from July until early September 2009. In Singapore, levels of ARI have remained elevated since mid April 2010; during the most recent reporting week, levels of ARI exceeded the epidemic threshold and the proportion of patients with ILI testing positive for pandemic influenza virus infection was 39%. In Bangladesh increased co-circulation of pandemic influenza and seasonal influenza type B viruses has been detected since mid April 2010 but now appears to have stabilized. Low level circulation of pandemic influenza continues to persist in Thailand and in the western and southern parts of India; sporadic detection of pandemic influenza continue to be reported in Cambodia and in the Philippines. In East Asia, only sporadic detections of pandemic influenza virus are being reported; seasonal influenza type B viruses have been predominant in this region, however circulation appears to be declining in China and the Republic of Korea.

In the temperate regions of the northern and southern hemisphere, overall pandemic influenza activity remains low to sporadic. In Australia and New Zealand, slight increases in ILI activity were reported; however, in Australia, these increases have been attributed primarily to circulating respiratory viruses other than influenza. In the southern temperate regions of the Americas, only sporadic detections of influenza viruses have been reported, except in Chile, which continues to report localized areas of increased ILI activity (in the Los Lagos area) associated with co-circulation of pandemic influenza and other respiratory viruses. In Europe, very low to sporadic levels of pandemic and seasonal influenza type B viruses continue to be detected. Seasonal influenza type B virus persists mainly in parts of eastern and northern Europe. Georgia reported an increase in the number of respiratory disease consultations due to influenza-like-illness (ILI), mainly in children (under age 5) and school-age children (5-14 years old age group); whether this increase is associated with pandemic influenza A (H1N1) virus is not yet known.

In Sub-Saharan Africa, limited data from several countries suggest that active transmission of pandemic influenza virus in West Africa has now largely subsided. In Ghana, 6% of respiratory samples tested positive for pandemic influenza virus during the most recent reporting week. Across the rest of region, the pandemic influenza virus continues to be detected sporadically or at low levels, most recently in Angola and Rwanda. Sporadic detections of seasonal influenza H3N2 and influenza B viruses have been reported in western, central Africa and to a lesser extent southern Africa.

MDCH reported **NO INFLUENZA ACTIVITY** to the CDC for the week ending May 22, 2010.

For those interested in additional influenza vaccination and education information, the MDCH *FluBytes* is available at http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html.

WHO Pandemic Phase: Phase 6 – characterized by increased and sustained transmission in the general population. Human to human transmission of an animal or human-animal influenza reassortant virus has caused sustained community level outbreaks in at least two WHO regions.

National, Human (JAMA and Archives Journals, May 24): Pregnant women who contract the H1N1 flu strain are at risk for obstetrical complications including fetal distress, premature delivery, emergency cesarean delivery and fetal death, according to a report in the May 24 issue of Archives of Internal Medicine, one of the JAMA/Archives journals.

"Novel influenza A (H1N1) is a pandemic respiratory infection commanding much attention by the international medical community," the authors write as background information in the article. "Little data have been reported regarding the impact of H1N1 on pregnant patients or the gestational fetus, and published reports have been conflicting." The study also notes that during prior seasonal influenza epidemics and pandemics, pregnant women have been reported to have increased hospitalization rates, increased illness and mortality, but no increase in birth defects. Historically, pregnant patients during the flu pandemics of 1918 and 1957 had high mortality rates.

"Because obstetrical patients make up a vulnerable population, it is crucial to characterize in them the severity and course of H1N1," writes Andrew C. Miller, M.D., of the State University of New York Downstate Medical Center and Kings County Hospital Center, Brooklyn, and colleagues. The researchers analyzed data from 18 patients, with an average age of 27, who were admitted to two urban academic medical centers with a diagnosis of H1N1 from May 18 to June 24, 2009. The results were then compared with published reports of the H1N1 outbreak and reports of flu pandemics of 1918 and 1957.

All patients were treated with oseltamivir phosphate beginning on the day of admission. Three of the 18 patients were admitted to the intensive care unit, and seven patients delivered during their hospital stay, six prematurely. Of these six premature births, five involved fetal distress and four were delivered via emergency Cesarean delivery (C-section). There were no congenital birth defects identified; however, two fetal deaths were recorded. No maternal deaths were reported.

"Little data are available regarding fetal outcomes and mortality rates among H1N1-infected mothers. Of the 18 patients in this series, one had a spontaneous abortion and one died postnatally from complications of extreme prematurity and sepsis," the authors write.

Based on the findings of the observational study, the authors conclude that "H1N1 poses a serious health threat to pregnant patients." The authors also conclude that fetal distress necessitating emergency Cesarean delivery may result in significant illness; however, this study showed an absence of maternal deaths as compared to prior study results. According to the authors' conclusions, "early antiviral treatment may improve maternal outcomes."

International, Mutations (The Times of India, May 25): The National Institute of Virology (NIV) here has detected 3 new variants of the H1N1 virus. Fortunately, all 3 variants have shown susceptibility to Tamiflu, the drug used in the treatment of swine flu. However, with the virus actively acquiring new properties, NIV scientists are apprehensive that it might develop resistance to the medicines used in treating swine flu. "For now, there is no need to worry. But we are closely monitoring the virus for any change in its virulence," NIV assistant director Sarah Cherian told the Times of India recently.

Cherian said 7 mutated variants of the virus have been found across the world so far. "As expected of the seasonal influenza virus, the H1N1 virus is also going through constant genetic variations which might lead to significant changes in its antiviral resistance," she said.

The variants of the H1N1 virus, representing both recovered and fatal cases from major cities -- Pune, Mumbai, Delhi, Hyderabad and Bangalore -- were analysed at the NIV, and the complete genomes of these variants were sequenced. The results of the genetic analysis have been published in the March 2010 issue of the US journal, PLOS One.

The NIV study, which compared the Indian viruses with 685 whole genomes of global viral isolates, revealed that the 1st Indian isolate of May 2009 belonged to a subtype (clade 5) and correlated to the time during which the dissemination of the virus was noted in Asia.

The later isolates of the period from June to September 2009 belonged to H1N1 variants (clades 6 and 7). The clade 7 variant was seen to be the dominant one, though no spatio-temporal patterns were noted within this variant, said Cherian. Among the established pathogenic markers, no significant change was observed in the Indian variants of the H1N1 virus.

The 1st influenza pandemic of the 21st century was declared with the emergence of a novel influenza A (H1N1) strain in Mexico and the US in April 2009. In its last H1N1 situation update released on 14 May 2010, the World Health Organisation said that more than 214 countries and overseas territories or communities have reported laboratory-confirmed cases of pandemic influenza H1N1 2009, including over 18 036 deaths.

Ed. Note: The article can be viewed online at http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0009693.

Michigan Wild Bird Surveillance (USDA, as of May 27): For the 2010 testing season (April 1, 2010-March 31, 2011), highly pathogenic avian influenza subtype H5N1 has not been recovered from 47 samples tested nationwide, including 3 Michigan samples (1 live wild bird, 2 hunter-killed birds). For more information, visit the National HPAI Early Detection Data System at http://wildlifedisease.nbii.gov/ai/.

To learn about avian influenza surveillance in Michigan wild birds or to report dead waterfowl, go to Michigan's Emerging Disease website at http://www.michigan.gov/emergingdiseases.

Please contact Susan Peters at PetersS1@Michigan.gov with any questions regarding this newsletter or to be added to the weekly electronic mailing list.

Contributors

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Table 1. H5N1 Influenza in Poultry (Source: http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm Downloaded 5/19/10)

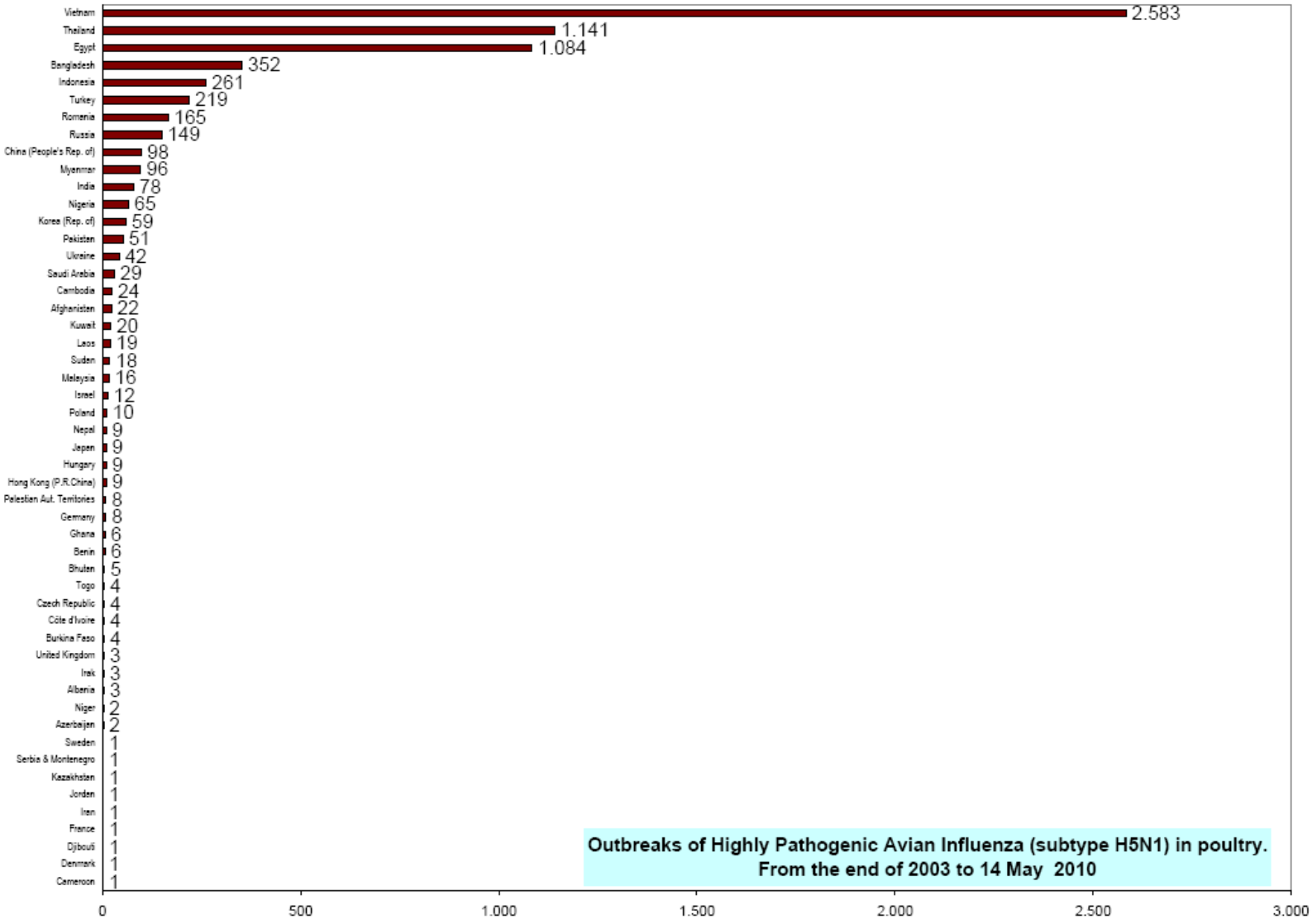

Table 2. H5N1 Influenza in Humans - Cases up to May 6, 2010. http://www.who.int/csr/disease/avian_influenza/country/cases_table_2010_05_06/en/index.html. Downloaded 5/10/2010. Cumulative number of lab-confirmed cases reported to WHO. Total cases includes deaths.

Country	2003		2004		2005		2006		2007		2008		2009		2010		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	1	0	1	1	10	8
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	0	0	38	25
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	39	4	19	7	109	34
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	21	19	3	2	165	136
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	3	2
Lao People's Democratic Republic	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	5	5	7	2	119	59
Total	4	4	46	32	98	43	115	79	88	59	44	33	73	32	30	12	498	294